

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  P58700B (WO)	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.  PCT/GB 03/03397	International filing date (day/month/year)  04/08/2003	(Earliest) Priority Date (day/month/year)  02/08/2002
Applicant  IMPERIAL COLLEGE INNOVATIONS LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03397

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C23C18/12 H05K3/28 C03C17/25 H01L51/20 H01G9/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C23C H05K C03C H01L H01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>PALOMARES EMILIO ET AL: "Slow charge recombination in dye-sensitised solar cells (DSSC) using Al2O3 coated nanoporous TiO2 films."</p> <p>CHEMICAL COMMUNICATIONS (CAMBRIDGE, ENGLAND) 21 JUL 2002, no. 14, 21 July 2002 (2002-07-21), pages 1464-1465, XP002283754</p> <p>ISSN: 1359-7345</p> <p>the whole document</p> <p style="text-align: center;">----- -/--</p>	1-74

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

8 June 2004

Date of mailing of the international search report

28/06/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Joffreau, P-0

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/03397

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>ICHINOSE I., SENZU H., KUNITAKE T.:  "Stepwise Adsorption of Metal Alkoxydes on Hydrolyzed Surfaces: A Surface Sol-Gel Process"  CHEMISTRY LETTERS,  vol. 25, no. 10, 1996, pages 831-832,  XP002283755  the whole document</p>	1-54, 61-74
X	<p>ICHINOSE I ET AL: "A SURFACE SOL-GEL PROCESS OF TiO<sub>2</sub> AND OTHER METAL OXIDE FILMS WITH MOLECULAR PRECISION"  CHEMISTRY OF MATERIALS, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US,  vol. 9, no. 6, 1 June 1997 (1997-06-01),  pages 1296-1298, XP000659326  ISSN: 0897-4756  cited in the application  the whole document</p>	1-54, 61-74
X	<p>KAY A ET AL: "DYE-SENSITIZED CORE-SHELL NANOCRYSTALS: IMPROVED EFFICIENCY OF MESOPOROUS TIN OXIDE ELECTRODES COATED WITH A THIN LAYER OF AN INSULATING OXIDE"  CHEMISTRY OF MATERIALS, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US,  vol. 14, no. 7, July 2002 (2002-07), pages 2930-2935, XP001190713  ISSN: 0897-4756  the whole document</p>	55-58,60
X	<p>TENNAKONE K ET AL: "Dye-sensitized solid-state photovoltaic cells: suppression of electron-hole recombination by deposition of the dye on a thin insulating film in contact with a semiconductor"  J. ELECTRON. MATER. (USA), JOURNAL OF ELECTRONIC MATERIALS, AUG. 2001, TMS; IEEE, USA,  vol. 30, no. 8, August 2001 (2001-08),  pages 992-996, XP002283756  ISSN: 0361-5235  the whole document</p>	55-58,60

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	<p>PALOMARES EMILIO ET AL: "Control of charge recombination dynamics in dye sensitized solar cells by the use of conformally deposited metal oxide blocking layers."</p> <p>JOURNAL OF THE AMERICAN CHEMICAL SOCIETY. 15 JAN 2003, vol. 125, no. 2, 15 January 2003 (2003-01-15), pages 475-482, XP002283757 ISSN: 0002-7863 page 476, left-hand column, paragraph 2 - right-hand column, paragraph 2; table 1 page 477, left-hand column, paragraph 2 page 479, right-hand column, last paragraph - page 480, left-hand column, paragraph 1; table 2 -----</p>	1-74